Association for Information Systems
AIS Electronic Library (AISeL)

ACIS 2010 Proceedings | Australasian (ACIS)

2010

Facilitating Information Sharing in Organizations using Electronic Content Management Systems (ECMS): Towards a Model

Noreen Izza Arshad
The University of Melbourne, narshad@pgrad.unimelb.edu.au

Rachelle Bosua
The University of Melbourne

Simon K. Milton
The University of Melbourne

Facilitating Information Sharing in Organizations using Electronic Content Management Systems (ECMS): Towards a Model

Noreen Izza Arshad*, Rachelle Bosua, and Simon K. Milton
Department of Information Systems
The University of Melbourne
Victoria, Australia, 3010.
*Correspondence email: narshad@pgrad.unimelb.edu.au

Abstract

This research-in-progress paper explores how the use of ECMS facilitates the sharing of business process-related information that supports end-to-end processes between business units in an organization. Based on an in-depth literature review, we propose a theoretical model to explain ECMS-use in two different types of business processes namely (1) processes with high or low Standardisation and (2) processes with high or low Integration. The model which will be tested in later stages of this research will provide a deeper explanation on how and why organizations may use ECMS in different ways as shaped by the Standardisation and Integration aspects of the organization's particular business process. Therefore, this study provides a deeper understanding on the use of ECMS and the value they can bring to organizations in terms of improving the sharing of information that supports the way the business operates.

Keywords

Electronic Content Management Systems, information sharing, business processes, Business Operating Model.

INTRODUCTION

The increasing growth in unstructured organizational information (commonly referred to as 'content') has become more important over the last few years. Jenkins (2006) states that the proportion of unstructured information is an estimated 80% of all information created across an organization. A number of authors state that it is difficult to share information in organization (Cho 2008; Mescan 2004; Munkvold et al. 2006; Smith and McKeen 2003), while Blair (2004) claims that the format of unstructured information makes it even more difficult to share. The nature of business processes require that a large volume of unstructured information (i.e. reports and invoices) needs to be shared between departments to enable efficient end-to-end processing of these processes.

As a result the deployment and use of ECMS products and technologies to manage unstructured information have been receiving significant uptake in modern organizations lately (Blair 2004; Paivarinta and Munkvold 2005). It is believed that these technologies are the panacea to manage vast amounts of unstructured organizational information (Blair 2004; Nordheim and Paivarinta 2006). Many of the ECMS technologies claim that they can facilitate the sharing of unstructured information across the organization (Andersen 2008; Bianco and Michelino 2010; Dilnutt 2006a; Dilnutt 2006b; Gupta et al. 2001; Nordheim and Paivarinta 2006; Smith and McKeen 2003). Blair (2004) describes ECMS as '*the technologies, tools and methods used to capture, manage, store, preserve and deliver content across an enterprise*'.

In the Information System discipline, ECMS have also become a prominent area of research (Nordheim and Paivarinta 2006; Smith and McKeen 2003). Research in ECMS concentrate mostly on two specific areas namely (1) technology aspects such as ECMS components, effectiveness and support for Knowledge Management (Dilnutt 2006; Smith and McKeen 2003) and (2) ECMS deployment (Munkvold et al. 2006; Paivarinta and Munkvold 2005). Even though these areas are important, a number of authors have expressed their views that there is not sufficient research on ways in which ECMS support the sharing of information within organizations (Bianco and Michelino 2010; Nordheim and Paivarinta 2006; Paivarinta and Munkvold 2005). In particular, Paivarinta and Munkvold (2005) and Tyrvainen et al. (2006) highlight that there is limited if any guidance to practitioners on how ECMS use can facilitate information sharing to support organizations' core processes.

The sharing of information is instrumental to the successful execution of one or more interrelated business processes. Over the last few years we have witnessed the rise in ERP systems that support the exchange of data between functional units in an organization. Even though, Jenkins (2006) states that ERP systems and ECMS are distinct, but he claims that these two types of systems can be integrated. Hence there is a gap in literature on ways in which ECMS can facilitate the flow of unstructured information between functional units in an organization. As a result there is a gap in understanding how ECMS use can improve the sharing of business process-related information within and between functional units in an organization.

In order to fill this gap in ECMS research, this study focuses on the question: *How can ECMS use facilitate the sharing of business process-related information within an organization?* The key objective of this study is to explore and provide explanations to business managers and practitioners on ways in which ECMS use can facilitate the sharing of business process-related information between and within business units in an organization.

This research-in-progress paper comprises an in-depth literature review and proposes a theoretical model to explain ECMS-use in two different types of business processes namely 1) processes with high or low Standardisation and 2) processes with high or low Integration (Ross et al. 2006). By combining these two types of business processes, organization's can be classified into four different organization types namely 1) Coordination, 2) Replication, 3) Diversification and 4) Unification (Ross et al. 2006). We have reason to believe that these four different types of organizations may use ECMS in different ways as shaped by the Standardisation and Integration aspects of the organization's particular business processes.

To find the answers to the research question, a model is proposed to guide the empirical study to follow in the later stages of this research. The model is synthesized from two main streams of inter-related research namely: 1) research in Electronic Content Management, and 2) research that provides a generic description of an organization's Business Operating Model (Ross et al. 2006). In the *ECMS Use* section, this paper revisits key research on ECMS and describes a framework specific to ECMS implementation. Next, in *The Business Operating Model* section, this paper introduces the Business Operating Model of Ross et al. (2006) that forms a key component of this research. The following section presents a research model that links ECMS use to information sharing and proposes four propositions to be used as a basis for empirical studies to follow in later stages. Testing of the propositions will confirm whether ECMS use is different as shaped by the organization's Standardization and Integration aspects of organizational business processes. The proposed research method is described in the *Next Stage* section while the final section concludes with expected contributions of this research.

ECMS USE

Contemporary organizations, whether large or small, public or private, share the common activities of producing and storing vast amounts of information (Cho 2008; Mescan 2004; Smith and McKeen 2003). Due to the growing volume of information, it is becoming more difficult to share these information assets across the organization. Considering the complexity of modern organizations, it is critical to share and reuse information to enable successful end-to-end processing of business processes. Therefore, over the last few years, there has been a growing interest in organizations to incorporate ECMS to improve information sharing within and across organizational business units (Jenkins 2006; Smith and McKeen 2003). Literature indicates that there has been a steady increase in the implementation and adoption of ECMS (Blair 2004; Gupta et al. 2001).

ECMS is a term introduced in 2001 by AIIM International and has since then been widely adopted by vendors, analysts, end users, practitioners and researchers (Blair 2004). ECMS is defined as:

> *"the technology that provides the means to create/capture, manage/secure, store/retain/destroy, publish/distribute, search, personalize and present/view/ print any digital content (i.e. pictures/images/text, reports, video, audio, transactional data, catalogue, code). These systems primarily focus on the capture, storage, retrieval, and dissemination of digital files for enterprise use."* (Meta Group, in Munkvold et al. 2006, p. 71).

In the context of this definition, the word 'content' refers to structured and unstructured digital information. Jenkins (2006) highlights that ECMS can manage both types of information (structured and unstructured). Information about business processes usually exist in structured forms that are based on numbers which are organized into tables (Blair 2004; Jenkins 2006). These tables can be manipulated or processed by applications software that is designed to process data into information. Jenkins (2006) mentions that ECMS can manage information in a structured format, such as the transactional data processed by an ERP system and the processing orders produced by an inventory system. On the other hand, information about a business process in unstructured format includes words, text, drawings, PDF files and pictures existing in free-forms. This type of information exists outside the organizational databases or business applications (Blair 2004). Jenkins further (2006) mentions that ECMS can manage information about business processes in this format, such as the vendor invoices, claim forms and word documents. In this study we will focus on the latter, i.e. the unstructured information or 'content' that relates to one or more business processes.

Over the last few years, ECMS technologies have converged into flexible technologies that manage a wide spectrum of aspects that relate to content (Dilnutt 2006; Jenkins 2006; Keyes 2006; Smith and McKeen 2003). Specifically, Dilnutt (2006) and Jenkins (2006) describe a number of components of the technologies that underpin ECMS, these are: content management systems, document management systems, records management systems, collaboration technologies, portal technologies, workflow systems and search and retrieval capabilities.

The Need to Share Business Process-Related Information

In most contemporary organizations, it is critical for one business unit to share its business process-related information with other business units. Business units are often dependent on each other because the sharing of business-process related information enables end-to-end processing (Jenkins 2006). Failure to share information between business units may affect a business in that it may delay a decision-making process.

Consider for example a process known as the exception-handling of invoices. This process represents an operation that requires the sharing of business process-related information across business units. This process starts when a vendor's invoice does not fulfil the requirements in quantity or price; thus, it requires exception handling. Business applications, such as ERP, can block the payment. But, before the payment can be blocked, the Accounting unit has to contact the unit that made the initial order by sending a notification email. The particular unit that made the initial order must resolve the problem by writing official letters, filling in forms and sending a notification email back to the vendor. This scenario shows that for exception-handling activities to be completed, unstructured information (for example official letters, forms, notification emails) about processes need to be shared across different business units. This example also shows that business applications, such as ERP system alone cannot ensure that all information is available. In this case, integrating ECMS with a business application such as ERP system ensures that business process-related information is available for sharing across units.

The scenario above reveals the need to understand how ECMS can facilitate the sharing of business process-related information between business units to enable end-to-end processing. But, as mentioned in the *Introduction*, despite the current promises that ECMS can facilitate the sharing of information, no research has yet been published that explains how ECMS can facilitate the sharing of business process-related information between or within business unit in an organization (Munkvold et al. 2006; Nordheim and Paivarinta 2004; Paivarinta and Munkvold 2005) However, a different yet related study by Paivarinta and Munkvold (2005) identifies a framework focused on ECMS implementation.

A Framework for ECMS Implementation

Paivarinta and Munkvold (2005) have suggested a general framework that guides practitioners on how they can implement ECMS in organizations (see Figure 1). Their study is a useful framework for practitioners to understand how ECMS implementation can impact on inter and intra-organizational information sharing.

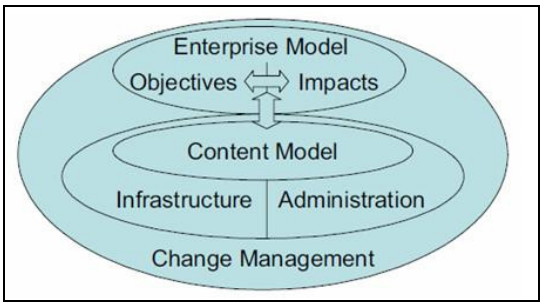

Figure 1: Framework for ECMS Implementation. Source (Paivarinta and Munkvold, 2005, p. 2)

According to their model above, *Objectives* refer to the fundamental reasons for implementing ECMS while *Impacts* are the specific reasons for implementing these technologies. Based on 58 cases, Paivarinta and Munkvold (2005) found 10 different *Objectives* and resulting *Impacts* of ECMS implementation as presented in Table 1.

Table 1. Objectives and impacts of ECMS implementation (Paivarinta and Munkvold, 2005)

Objective	Impacts
Internal and external collaboration	Resulting in improved management of knowledge creation, sharing of digital resources and reaching out from within the enterprise itself to the partners and business networks
Value added or new customer services and products	To add value or new customer services and products involving digital resources
Reliability and quality of information	Resulting in less error in products and services
Modern and professional image of the enterprise	Improved and professional image in the eyes of its stakeholders

Inter and Intra-organizational information and knowledge sharing	Resulting in improved management, reusing and sharing of digital information within an organization and between organizations
Meaningful knowledge work	Involving easier and less tedious human routine work
Organizational memory	For recording the practice, history, and transactions of the enterprise
Direct cost savings	Saving cost in information processing operations and facilities
Satisfying external regulations and standards	Satisfying the external regulations and standards directly or indirectly governing the organization's information management
Platform and capabilities to develop and maintain targeted content management applications quickly	To develop and maintain content management applications quickly for emerging purposes

The framework of Figure 1 suggests that:

(i) An organization's ECMS implementation should support *Objectives* driven by the organization's *Enterprise Model*. *Enterprise Model* refers to what needs to be done in the enterprise (Paivarinta and Munkvold 2005).

(ii) ECMS implementation based on *Objectives* results in more or less anticipated and desired *Impacts*.

(iii) ECMS is realized through the design and implementation of the *Content Model* from the viewpoint of the *Enterprise Model*.

(iv) The implementation of ECMS is supported by the technological *Infrastructure* and *Administrative* resources in place.

(v) *Change Management* is needed for a successful ECMS adoption.

Part of the framework suggests that any ECMS implementation should support the desired *Objectives.* In Table 1, no single type of Objective could be identified as the most important (Paivarinta and Munkvold 2005). Yet, several objectives can be intertwined in the single initiative of a particular case. For the purpose of this research, we will focus on one of the *Objectives* outlined in Table 1: ECMS as a tool for facilitating *intra-organizational information sharing* or the sharing of information between and within business units in an organization.

The reason for choosing this objective is because many organizations adopt and use ECMS as a tool that facilitates information sharing. A survey conducted by the AIIM Industry Research Group (2009) reveals that ECMS is predominantly used for sharing information. Among survey respondents, 47% ranked ECMS as a tool that is significantly used for sharing. The next most chosen or important objective is collaboration with 26% respondents. Choosing this, the AIIM Industry Research Group (2009) concludes that organizations implement ECMS for various reasons, but the significant use remains focused on information sharing.

The Role of an Enterprise Model in ECMS Use

Referring to Figure 1, Paivarinta and Munkvold (2005) highlight that ECMS implementation will lead to the realization of the desired *Objectives,* but they also mention that the ways in which sharing will happen will in turn be driven by an *Enterprise Model*. An *Enterprise Model* is important since it (Paivarinta and Munkvold 2005): (1) is a shared idea about what needs to be done in an enterprise, (2) represents an idea of the business, (3) specifies required operations within the enterprise, (4) explains how the operations reach selected partners and customer networks and, (5) describes the user roles and rights in the operations.

Relating to the *Enterprise Model*, Paivarinta and Munkvold (2005) found that the realization of ECMS *Objectives* vary among cases and is seemingly dependent on the business area or domain in which the enterprise is operating. For example, logistics companies (such as FedEx) often emphasize Standardization in their operations. They use ECMS as a tool that ensures that every business unit shares and reuse processes (for instance, following the same invoice management process). Others (for example, BOC Gases) emphasize Integration across their business. BOC Gases is involved in managing intra-organizational projects to build plants. In their case, ECMS is used as a tool for sharing documents and other types of information with subcontractors and business partners to complete the plants.

The Need for a Generic Enterprise Model to Guide Information Sharing

Considering the two different examples described earlier, Tyrvainen et al. (2006) argue that a gap exists where there is no enterprise model identified in the ECMS literature that can fully represent all types of organizations. This argument is supported by Paivarinta and Munkvold (2005) who state that different organizations often have different ideas about the concepts needed for their enterprise model. This situation occurs because different

organizations support and emphasize different business processes. Thus, the challenge is to find the representation of an enterprise model that is more focused on organizations' business processes.

Considering this challenge, Ross et al. (2006) introduce a generic Business Operating Model that relates a firm's operations, expressed in terms of business processes, and the use of IT. We argue that it is a good candidate for an enterprise model in ECMS research because:

(i) Its generic nature allows it to be applicable to all types of organizations. The reason it is considered to be generic and applicable to all types of organizations is explained further in the next section.

(ii) It can be applied to any type of information technology used at the enterprise level (including ECMS).

(iii) It is specific about an organization's operations and architecture and expresses these at the business process level.

(iv) It is adequately rigorous and is based on more than 100 case studies in various types of organizations.

Furthermore, this study assessed and found that the Business Operating Model in fact complements the characteristics of the *Enterprise Model*, as presented in Table 2.

Table 2. The Enterprise Model and the Business Operating Model: Their matching characteristics

The Enterprise Model (Paivarinta and Munkvold, 2005)	**The Business Operating Model** (Ross et al., 2006)
1. It refers to a shared idea of what needs to be done in an enterprise	1. It describes how a company wants to thrive and grow
2. It refers to the idea of the business	2. It describes how the company operates
3. It refers to the required operations within an enterprise and the operations to reach selected partners and customer networks	3. The Business Process Standardization dimension defines exactly how a process will be executed in an organization. The Business Process Integration dimension describes the necessary level of Integration (e.g.: sharing data for delivering goods) in the organization and among trading partners (e.g.: customers)

Furthermore, Ross et al. (2006) explain that the Business Operating Model may be used to: (1) represent a general vision of how a company will enable and execute strategies, (2) guide the implementation of IT based on business process capabilities, (3) provide insights and tools to align IT and IT-enabled business processes, (4) define the roles of Business Process Standardization and Integration in the company's daily decisions and operations, (5) declare which business processes will distinguish a company from its competitors and, (6) better understand how information about business processes can be acquired and shared based on the way the organizations conduct their business.

Summarising, one of the objectives for implementing and using ECMS is intra-organizational information sharing. However, there is no literature that explains how and why organizations use ECMS for intra-organizational sharing. Further, Paivarinta and Munkvold (2005) highlight the need for an enterprise model that drives the specifics of the sharing that occurs. We know from Paivarinta and Munkvold (2005) that it is a firm's enterprise model that explains how the objectives of implementing ECMS are realised. Therefore we select a mature model of how IT underpins a firm's process architecture as the enterprise model for explaining how ECMS (a type of IT) objectives are realized. This model is the Business Operating Model of Ross et al. (2006) and is further explained in the next section. Following this, we explore the relationship between the enterprise model and the objective of intra-organizational information sharing and build a research model to explain the link.

THE BUSINESS OPERATING MODEL

In relation to the previous section that briefly introduced the Business Operating Model, this section will continue to discuss this model in-depth. According to Ross et al. (2006), an operating model describes:

> *"The necessary level of business process integration and standardization for delivering goods and services to customers. An operating model describes how a company wants to thrive and grow. By providing a more stable and actionable view of the company than strategy, the operating model drives the design of the foundation for execution."*

Based on this definition, Ross et al. (2006) introduce the notion of Business Process Standardization and Integration. The Standardization of business processes and related systems means defining exactly how a process

will be executed. The result of Standardization is a reduction in the variability of processes. On the other hand, the Integration of business processes links the processes between business units through shared data and information. This sharing of data and information between processes enables end-to-end processing.

The combination of these two dimensions represents a two-dimensional Business Operating Model with four quadrants namely Replication, Coordination, Unification and Diversification as illustrated in Figure 2. As mentioned in the previous section, it is considered a generic model that relates to all types of organizations, whether large or small, profit or non-profit, or government. Each organization can be positioned in one of the quadrants, based on the degree of Integration and Standardization of its processes.

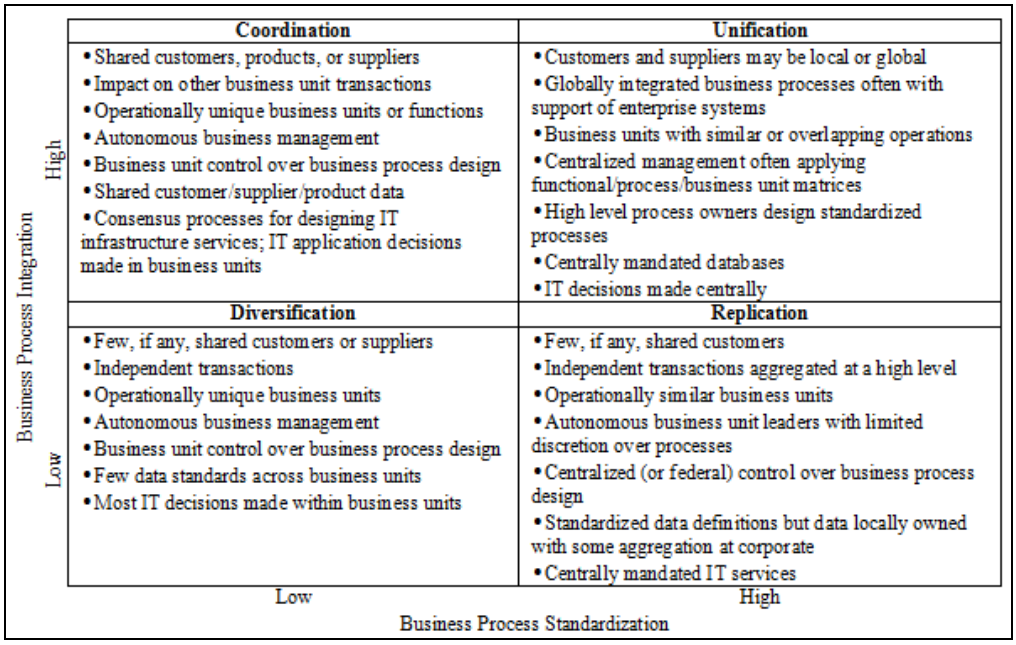

Figure 2: The Business Operating Model. Republished with permission (Ross et al. 2006, p.29).

Considering the six different uses of the Business Operating Model mentioned in the previous section, this study will focus on how to use it to: (1) guide the implementation of ECMS (a type of IT) based on business process capabilities, and (2) better understand how information about business processes can be shared using ECMS to supports core operations.

Business Operating Model and ECMS Implementation

For the purpose of this research, we focus on how the Business Operating Model can guide the implementation of ECMS that supports business processes. This will benefit organizations in such that ECMS can be embedded in their work processes so that the core operations of the company can be well executed. Relating to this, the Business Operating Model explains that:

- Replication types of organizations should implement technologies that enable the reuse of standardized processes and business modules between business units.
- Coordination types of organizations should implement technologies that can: (1) be the integrated hub that can capture and access data from legacy systems and other business applications, and (2) guiding access to relevant information.
- Unification types of organization should implement technologies that can: (1) allow the sharing of codified processes, (2) be the integrated hub that stores and accesses data from legacy systems and other business applications, and (3) allow access to relevant information.
- Diversification types of organization should implement technologies that support business unit operations. Some Diversification organizations may need technologies that allow the sharing of standardized processes such as financial reporting and quality assurance documentation.

Business Operating Model and the Sharing of Information

The Business Operating Model helps to better understand how business process-related information that supports the core operations should be shared within organizations. Ross et al. (2006) highlight that it is important for business managers to understand what critical business process-related information needs to be shared using

technologies. This is important because the sharing of business process-related information enables the end-to-end processing. Relating to this, the Business Operating Model explains that:

- In Replication types of organizations, business units share information about standardized processes, such as quality assurance documentation and codified policies and procedures.
- In Coordination types of organizations, business units share information about integrated business processes to enable end-to-end processing. Business units share information, such as transactional data, and inventory lists produced by other business applications (for example, ERP and supply chain management) and stored in databases.
- In Unification types of organizations, business units share information about common standardized processes, such as human resource process templates to plan salaries and incentives. Business units also share information about integrated business processes to complete certain operations. For example, they share transactional data from ERP system and processing orders from SAP applications.
- In Diversification types of organizations, business units may share standardized processes, such as financial reporting, risk management and quality assurance documentation.

A RESEARCH MODEL LINKING INFORMATION SHARING AND THE BUSINESS OPERATING MODEL

Based on the discussions of the preceding key concepts, this study proposes a research model in Figure 3 to guide future empirical study to follow in later stages. This model combines the conceptual elements of ECMS use, information sharing about business process within an organization and the Business Operating Model.

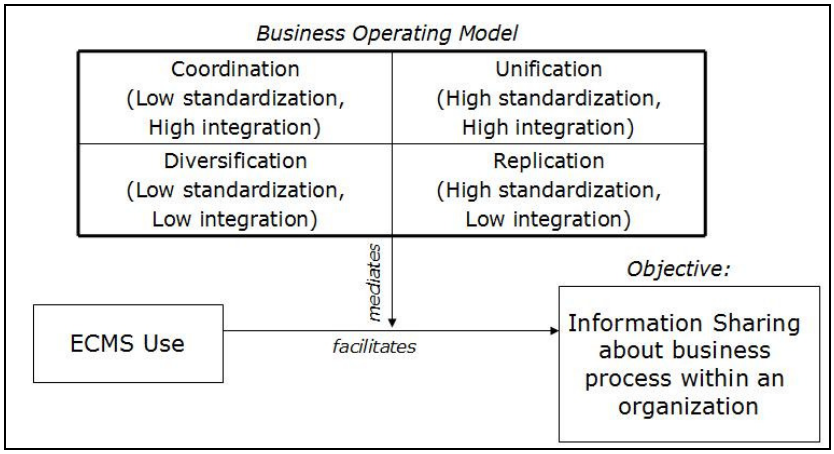

Figure 3: The proposed research model

This model proposes that *'ECMS use, mediated by the Business Operating Model, facilitates the sharing of information about business process within an organization'*. In this context, '*facilitates*' means that ECMS technologies can make the process of sharing easier. '*Mediates*' indicates that the *mechanisms by which the sharing happens vary according to the type of operating model in an organization*. Referring to the objective box shown in Figure 3, *'within an organization'* is referring to *inter-business units* and *intra-business unit* in the same organization. For the purpose of this research, *inter-business units* refer to the sharing of information that happens between business units in an organization. On the other hand, *intra-business unit* refers to information sharing within the same business unit.

Based on this research model, four propositions are derived and explained in the following paragraphs. These propositions will guide the future empirical research in the later stages.

Inter-Business Unit Information Sharing for High Business Processes Standardization

In organizations with highly standardized business processes, Ross et al. (2006) state that every business unit within this type of organization will run their operations in a standardized fashion. In these types of organizations (Replication and Unification, in Figure 2), it is important for business units to share information about business processes which are repeatable and reusable. Examples of repeatable and reusable business process-related information to be shared are information about business process design, standardized core processes and standardized practices. It is important for business units to share this type of information because the success of the organization as a whole depends on all business units implementing similar sets of standardized business processes. Therefore, considering this type of organizations, this research proposes that:

Proposition 1: For organisations with high standardized business processes, the use of a centralized ECMS will facilitate and lead to higher inter-business units information sharing.

Intra-Business Unit Information Sharing for Low Business Processes Standardization

In organizations with low standardized business processes, Ross et al. (2006) state that business units do not have common ways of doing business. Thus, in these types of organizations (Diversification and Coordination, in Figure 2), business units rarely share information about standardized and repeatable processes. Although business units appear not to share information with other business units, they still share standardized processes within the same unit. Within a business unit, it is important to share information about standardized processes for example financial reporting, risk management and quality assurance documentation. Therefore, considering this type of organizations, this research proposes that:
Proposition 2: For organisations with low standardized business processes, the use of a decentralized ECMS will facilitate and lead to higher intra-business unit information sharing.

Inter-Business Unit Information Sharing for High Business Processes Integration

In organizations with highly integrated business processes, Ross et al. (2006) state that business units share business objects such as: customers, products, suppliers and partners. It is important for business units within the organization to share these business objects to enable end-to-end processes. For example, business units will need to share certain business objects to complete processes such as cross-selling and integrated customer services. In these types of organizations (Coordination and Unification, in Figure 2), the success of the company is dependant on access to shared business objects within the whole organization. Therefore, considering this type of organization, this research proposes that:
Proposition 3: For organizations with high integrated business processes, the use of ECMS content categorized according to shared business objects, will facilitate and lead to higher inter-business units information sharing.

Intra-Business Unit Information Sharing for Low Business Processes Integration

In organizations with low integrated business processes, the business units are not dependant on shared business objects. In these types of organizations (Replication and Diversification, in Figure 2), business units are not dependant on each other's business transactions. However, it is important for the each business unit to manage and share its business objects to complete its daily transactions because the success of the organization depends on the success of individual business units. Therefore, considering these types of organizations, this research proposes that:
Proposition 4: For organizations with low integrated business processes, the use of ECMS content categorized according to shared business objects, will facilitate and lead to higher intra-business unit information sharing.

NEXT STAGE: TOWARDS AN EMPIRICAL STUDY

As mentioned before, this research-in-progress will proceed to the data collection phase. Hence, to find evidence and test the four propositions discussed in the previous section, a qualitative research method will be conducted using four case studies. A multiple case study approach takes advantage of the natural variations in business processes that would be extremely difficult to simulate in a laboratory environment. The four case studies will involve four different types of organizations (one organization will be selected for each quadrant in Figure 2). The organizations must (1) be a large organization and (2) have and are using ECMS technologies. For each case study, the unit of analysis will be the four selected business processes. This is because, in the context of this study, ECMS are used as a tool that facilitates the sharing of business process-related information. Thus, the business process is the unit around which information is centred and shared between business units.

Furthermore, the case studies will be carried out using methods and approaches detailed by Yin (2009) and Miles and Huberman (2002). In each of the case studies, interviews will be the primary data collection method. For each case organization, the following staff will be interviewed: the CIO, the IT manager, two business unit managers, and four other ECMS users. During interviews, participants will be asked to describe how they use ECMS for sharing information with another or within the same business unit to complete certain work processes.

Apart from the interviews, the researcher will also conduct a number of on-site observations. Observations will provide further reality checks on what has been reported in the interviews. Relating to the research objectives, it is therefore necessary to observe how people actually use ECMS for sharing information about work processes between and within business units.

Next, the researcher will conduct a data analysis in two stages with a few rounds of coding and thematic analysis (Miles and Huberman 2002). In the first stage, a within case analysis will be performed. During this analysis, the transcribed interviews will be broken into sentences or paragraphs. These will be grouped into categories of

themes derived from the literature. Following this, the researcher will compare and contrast the analyzed interview data with the descriptive field notes gathered during the observations. If the result shows that ECMS are used in the same way as predicted between the four different business processes within the same organization, this will indicate that the particular proposition is demonstrated. The researcher will then indicate the extent of the literal replication logic, based on the case study results.

In the second stage, a cross-case analysis will be performed. At this stage, the researcher will compare and contrast the categories that emerge within each quadrant and refine the thematic analysis by performing a cross-case comparison. If the outcomes show that each quadrant has actually demonstrated the propositions, the researcher can then draw a cross-case conclusion. The researcher will also indicate the extent of the theoretical replication logic across different case organizations.

CONCLUSION

In this research-in-progress paper, we propose a theoretical model to close a gap found in the ECMS literature. The model which will be rigorously tested in the next stage of this research explains how and why organizations use ECMS to share information about business processes within an organization. Specifically, this paper argues that it is the Business Operating Model of Ross et al. (2006) that clarifies how ECMS is used in business processes. In particular this research may proof that it is the degree of Standardisation and Integration of the business processes that determines the use of ECMS technology in a business process execution. In this paper, we have explained why this deepens our understanding of how companies use ECMS technology in business processes. Further, we have proposed four testable propositions to take this study into the next stage.

The next stage of this study will rigorously test the model by testing the four propositions using multiple case studies. Beyond testing the four propositions this empirical stage will explain how ECMS are used in the two different types of business processes: 1) processes with high or low Standardisation and 2) processes with high or low Integration (Ross et al. 2006). We have argued that the four different types of organizations (Coordination, Replication, Unification and Diversification) will use ECMS in different ways as shaped by the Standardisation and Integration aspects of the organization's particular business process. Therefore, future research is needed to empirically validate the model of this study. Furthermore, once the data collection with the four case organizations commence, it is anticipated that the model will be refined based on the case study results.

The findings of the larger study will contribute to the literature by explaining how ECMS can be used to share business process information between and within business units. In particular, it extends our understanding of the specific value that ECMS may add in the sharing of information between and within business units in different types of organizations (Replication, Coordination, Unification and Diversification). On the other hand, the outcomes of this study may benefit practitioners, for example IT managers will understand ways in which ECMS use can be embedded in their business processes to improve the sharing of business process-related information between and within business units. Moreover, the research findings may help business managers to understand the value that ECMS can bring to their organizations. From a managerial perspective, this research may be helpful in: 1) guiding managers when decisions need to be made to invest in ECMS technology and 2) appropriating ECMS technologies to gain more benefit from its use.

REFERENCES

Bianco, F., and Michelino, F. 2010. "The Role of Content Management Systems in Publishing Firms," *International Journal of Information Management* (30:2), April, pp 117-124.

Blair, B.T. 2004. "An Enterprise Content Management Primer," *Information Management Journal* (38:5), October, pp 64-66.

Cho, V. 2008. "A Study of the Effectiveness of Electronic Document Management Systems," *International Journal of Information Technology and Management* (7:3), pp 327 - 352

Dilnutt, R. 2006. "Enterprise Content Management: Supporting Knowledge Management Capability," *International Journal of Knowledge, Culture and Change Management* (5:8), pp 73-84.

Gupta, V.K., Govindarajan, S., and Johnson, T. 2001. "Overview of Content Management Approaches and Strategies " *Electronic Markets* (11:4), pp 281-287.

Jenkins, T. 2006. *Enterprise Content Management Technology*. Canada: Open Text Corporation.

Keyes, J. 2006. *Knowledge Management, Business Intelligence and Content Management: The IT Practitioner's Guide*. New York: Auerbach Publications.

Mescan, S. 2004. "Why Content Management Should Be Part of Every Organization's Global Strategy," *Information Management Journal* (38:4), August, pp 54-57.

Miles, D. 2009. "State of the ECM Industry 2009, Who Achieved It, How Are They Doing It and Is It Working for Them?" *AIIM Market Intelligence: Delivering the priorities and opinions of AIIM's 65,000 community* Retrieved 13 July 2010, 2010, from http://www.oracle.com/us/products/middleware/content-management/059472.pdf

Miles, M.B., and Huberman, M.A. 2002. *The Qualitative Researcher's Companion*. London: Sage Publications.

Munkvold, B.E., Päivärinta, T., Kristine, A., Hodne, and Stangeland, E. 2006. "Contemporary Issues of Enterprise Content Management," *Scandinavian Journal of Information Systems* (Vol. 18:No. 2), pp 69-100.

Nordheim, S., and Paivarinta, T. 2004. "Customization of Enterprise Content Management Systems: An Exploratory Case Study," in: *Proceedings of the Proceedings of the 37th Annual Hawaii International Conference on System Sciences (HICSS'04) - Track 4 - Volume 4*. IEEE Computer Society.

Nordheim, S., and Paivarinta, T. 2006. "Implementing Enterprise Content Management: From Evolution through Strategy to Contradictions out-of-the-Box," *European Journal of Information System* (15:6), October, pp 648-662.

Paivarinta, T., and Munkvold, B.E. 2005. "Enterprise Content Management: An Integrated Perspective on Information Management," in: *Proceedings of the Proceedings of the 38th Annual Hawaii International Conference on System Sciences (HICSS'05) - Track 4 - Volume 04*. IEEE Computer Society.

Ross, J., Weill, P., and Robertson, D.C. 2006. *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution*. Boston: Harvard Business School Press.

Smith, H.A., and McKeen, J.D. 2003. "Developments in Practice Viii: Enterprise Content Management," *The Communications of the Association for Information Systems* (11), pp 647-659.

Tyrvainen, P., Paivarinta, T., Salminen, A., and Iivari, J. 2006. "Characterizing the Evolving Research on Enterprise Content Management," *European Journal of Information Systems* (15:6), December, pp 627-634.

Yin, R.K. 2009. *Case Study Research Design and Methods*, (4th Ed.). California, USA: SAGE Publications, Inc.

ACKNOWLEDGEMENTS

The authors wish to thank the two anonymous reviewers for their helpful comments and input.

COPYRIGHT